NUMB. XXXII.

The Universal Instructor in all Arts and Sciences:

AND

PENNSYLVANIA GAZETTE

To be continued Weekly. *The 7th of the 6th Month*, 1729.

AIR

Mechanical Properties and Effects of Air.

1. *Fluidity.*----- That the *Air* is a Fluid, is evident from the eaſy Paſſage it affords to Bodies thro' it; as in the Propagation of Sounds, Smells, and other Effluvia: For this argues it a Body whoſe Parts give Way to any Force impreſs'd, and in yielding, are eaſily mov'd among themſelves; which is the Definition of a Fluid.

They who, with the *Carteſians*, make Fluidity conſiſt in a perpetual inteſtine Motion of the Parts, find Air alſo anſwers to that Character: Thus, in a darkened Room, where the Species of external Objects are brought in by a ſingle Ray; they appear in a continual Fluctuation; and thus even the more accurate Weather-Glaſſes are obſerv'd never to remain a Moment at Reſt.

The Cauſe of this Fluidity of Air is attributed by ſome late Philoſophers to the Fire intermix'd therewith; without which, they imagine, the Atmoſphere would harden into a ſolid, impenitrable Maſs. And hence, the greater the Degree of Fire therein, the more fluid, moveable and pervious the Air: And thus, as the Degree of Fire is continually varying; according to the Circumſtances and Poſition of the Heavenly Bodies; the Air is kept in a continual Reciprocation.

Hence, in good Meaſure, it is, that on the Tops of the higher Mountains, the Senſes of Smelling, Hearing, *&c.* are found very feeble.

2. *Weight*, or *Gravity*. That the *Air* is heavy, follows from its being a Body; Weight being an eſſential Property of Matter.

But we have infinite Arguments of the ſame from Senſe and Experiment: Thus the Hand applied on the Orifice of a Veſſel empty of Air, ſoon feels the Load of the incumbent Atmoſphere. Thus Glaſs Veſſels, exhauſted of their Air, are eaſily cruſh'd to Pieces by the Weight of the Air without. So, two ſmall hollow Segments of a Sphere, exactly fitting each other, being emptied of Air, are preſs'd together with a Force equal to 100 Pound, by the Pondus of the ambient *Air*.

Further, a Tube cloſe at one End, being filled with Mercury, and the other End immerged in a Baſon of the ſame Fluid, and thus erected; the Mercury in the Tube will be ſuſpended to the Height of about 30 Inches above the Surface of that in the Baſon. The Reaſon of which Suſpenſion, is, that the Mercury in the

AIR

Tube cannot fall lower, without raiſing that in the Baſon; which being preſs'd down with the Weight of the incumbent Atmoſphere, cannot give way, unleſs the Weight of the Mercury in the Tube, exceeds that of the Air out of it. That this is the Caſe, is evident hence, that if the whole Apparatus be included in an Air-Pump, in Proportion as the Air is exhauſted from the ſame, the Mercury falls; and gradually letting in the Air again, the Mercury reaſcends to its former Height. This makes what we call the *Torricellian Experiment*.

To ſay no more, we can actually weigh Air: For a Veſſel, full even of common Air, by a very nice Ballance, is found to weigh more than when the Air is exhauſted; and the Effect is proportionably more ſenſible, if the ſame Veſſel be weigh'd full of condenſed Air, and void of Air.

The Weight of Air is continually varying, according to the different Degree of Heat and Cold. *Ricciolus* eſtimates its Weight to that of Water, to be as 1 to 1000; *Merſennus* as 1 to 1300, or 1356; *Galileo* only makes it as 1 to 400. Mr. *Boyle*, by a more accurate Experiment, found it about *London*, as 1 to 938; and thinks, all Things conſider'd, the Proportion of 1 to 1000 may be taken as a Medium; for there is no fixing any preciſe Ratio, ſince not only the Air, but the Water it ſelf, is continually varying. Add, that Experiments made in different Places neceſſarily vary, in regard of the different Heights of the Places, and the different Conſiſtences of *Air* ariſing therefrom.

It muſt be added, however, that by Experiments made ſince before the Royal Society, the Proportion of Air to Water was firſt found as 1 to 840; then, as 1 to 852; and a third Time, as 1 to 860. And laſtly, by a very ſimple and accurate Experiment of the late Mr. *Hawksbee*, the Proportion was ſettled as 1 to 885. But theſe Experiments being all made in the Summer-Months, when the Barometer was 29 Inches 3 Quarters high; Dr. *Jurin* thinks, that at a Medium between Heat and Cold, when the Barometer is 30 Inches high; the Proportion between the two Fluids, may be taken as 1 to 800.

Air, then, being heavy and fluid, the Laws of its Gravitation, or Preſſure, may be inferr'd to be ſame as in other Fluids; conſequently, its Preſſure muſt be as its perpendicular Altitude.

This

This is also confirmed by Experiment. For, removing the Torricellian Tube to a more elevated Place, where the incumbent Column of Air is shorter; a proportionably shorter Column of Mercury is sustained; it being found to descend at the Rate of one Fourth of an Inch, for every 100 Foot of Ascent.

On this Principle depends the Structure and Office of the Barometer.

The Dialogue continued.

Landl. *But what dost talk then of Prayer being the first Duty? Why, if that be the first Thing, I must not begin; for how can such a Creature as I pray to God?*

Will. *As the Spirit of God will assist those, whose Hearts are toward him, so we must pray that we may be taught to pray.*

Landl. *Is it not a difficult Thing for a Man to pray to God,* William, *that scarce ever thought of God in all his Life?*

Will. *Well, Sir; but who do* you *think put those Thoughts into* your *Mind, which* you *now have? and who open'd* your *Eyes, Sir, to see a Beauty in Religion, as* you *see? and touch'd* you *Heart with such an earnest Desire after the Ways and Things of God, as* you *now expressly say* you *have? Do* you *think this is not of God,* and't please you?

Landl. *Indeed,* William, *I know not; it would be a very delightful Thing to me, if I thought it was so.*

Will. *Without Question Sir, it is: Man can have no such Power; Nature prompts us to evil Thoughts and evil Desires, and to them only;* the Imagination of the Thoughts of our Hearts are evil, and only evil; *if there are any good Motions, or heavenly Desires in the Heart, they are all from God.* Every good Giving, and every perfect Gift comes down from above; *'tis his Power works them, his invisible Grace forms all holy Desires in the Soul.*

Landl. *Well; and what do* you *infer from thence,* William?

Will. *Why, Sir, if God has begun a good Work, he will perfect it; if he has turned* your *Face toward him, he will lift up your Heart to him: To pray to God is as natural to a Convert, as to cry after the Father or Mother is to an Infant.*

Landl. *Thou speakest,* William, *with more Clearness than ever I heard before! but 'tis a strange thing to me to talk of praying to God: I pray! that, except just the common Road of going to Church, cannot say that ever I kneel'd down to pray to God once in all my Life! How shall I pray?*

Will. *That's sad indeed! I am sorry to hear* your *Worship say so; does any Creature live and not pray to God! O dear! that's a sad dreadful Thing in Truth! but however, Sir, do not let that hinder you now.*

Landl. *How dost mean, hinder me? What can be said to hinder me doing what I have no Knowledge in, no Notion of, no Inclination to?*

Will. *O Sir, and't please you, you mistake your own Condition very much: Do not discourage your self thus; you know how to pray, better than many that make much Noise with their Devotions. I see it plainly.*

Landl. *I pray! William! I pray! I tell thee, I never pray'd in my Life, as I know of.*

Will. *And't please* your *Worship not to be angry with me for my plain Way------*

Landl. *Prithee,* William, *be plain, and speak freely; don't* Worship me, *and* Sir me *now; talk to me, as if* I *were* your *Neighbour or Comrade; these are not Things to be talk'd of with Cringes and Bows: I am a wretched, contemptible, poor rich Man, thou art a poor rich, happy Christian; talk plainly, the courser the better, I like it best; there will be no Difference,* William, *between thee and* I *hereafter, but what will be on thy Side; tell me therefore what* you *mean,* William, *by my praying.*

Will. *Why, Sir, if* you *allow me to be plain then,* I *say* you *mistake* your *own Condition, and thereby put off the Comfort* you *might receive;* I *say,* you *do pray, and know better how to pray than many that appear as if they pray'd every Day.*

Landl. *You must explain* your *self,* William, *I do not understand you.*

Will. *Why Sir, those earnest Desires* you *have after the Knowledge of God; and after the true Worship of God, which is the Sum of Religion,* I say, those earnest Desires are really Prayers in their own Nature. Sincere Wishes of the Heart for Grace are Prayers to God for Grace; Prayer it self is nothing but those Wishes and Desires put into Words, and the first is the essential Part; for there may be Words used without the Desire, and that is not Prayer, but a Mockery of God; but the Desires of the Heart may be Prayers even without the Words.

Landl. *You surprize me a little,* William.

Will. *Besides, Sir, those earnest Desires you have after Religion, and after the Knowledge of God, will force* you *to pray first or last, even in a verbal Prayer; they will break out like a Flame that cannot be withheld;* your *Heart will pray when* you *know not of it: Praying to God, Sir, is the first Thing a Sense of Religion dictates, as a Child cries as soon as it is born.*

Landl. *Alas!* William! *I know nothing of it; I am such an unaccountable Wretch, God knows, I know nothing what belongs to praying, not I; thou hast let me see farther into it, by that thou saidst just now, than ever I saw or heard before.*

Will. *Why, look ye, now,* I *told* you *it would break out when* you *knew not of it, and* you *would pray to God before you were aware? Did* you *not pray just now?*

Landl. *Pray! Why, what did I say? I said, I know nothing of Prayer.*

Will. *Nay that was not all? What is the Meaning of those Words,* Alas, William! *and whence came that Sigh when* you *called* your *self that hard Name? and what was the Sense of* your *Soul but this,* God be merciful to me, and teach me to pray; for alas, I know nothing what belongs to praying: *Was not all this praying?*

Landl. *Indeed,* William, *my Heart had such a kind of Meaning; but I cannot form the Thought into Words, no not in my very Soul.*

Will. *It's all one Sir: God that moves the Soul, certainly hears his own Motion; how should he but hear it? is it not his own working!* The Preparation of

the Heart, and the Answer of the Tongue, is it not of the Lord: *He will hear every sincere Desire which he forms in* your *Soul, whether it be conceived into Words or no; for it is the Voice of his own Spirit and Grace.*

Landl. Thou art a comforting Preacher, *William*, I don't wonder you enjoy such a shining Beam of Light in your own Soul, when you have such a Sense of Things as this; you shall be my Instructor *William*, I may call you Father rather; for thou art better to me than Ten Fathers.

Will. O Sir, my Discomforts are very great, and the Beam you speak of is very dim in me; do not speak such Things of me; it makes me very sad; for I know my own Darkness, I am a poor despis'd Creature.

Landl. Well, but God may make you an Instrument of Good to me, or in any one he pleases: I never had thus much Instruction in my Life, *William*; you will not be backward to do good, I hope, if it be thus cast in your Way.

Will. I shall be very glad, if such a Worm as I am, should be an Instrument in God's Hand to comfort or inform your Worship, and shall praise God for this Occasion, as long as I live; and indeed I rejoyce to see your Worship enquiring after these Things; I pray God encrease the Knowledge of himself in your Mind, and comfort you with the Hope of his Presence and Blessing.

Landl. *Amen.* I thank you *William.*

Will. Look you now, Sir, did you not pray then again?

Landl. I joyn'd with you, *William*; I don't know;---- but if that be praying, I think I did pray.

Will. Thus God will move your Heart to pray to him; and I beseech your Worship to read the Scriptures; read them much, read them seriously and humbly, and pray, Sir, observe this one Thing, when you read, which I have experienc'd often, and very comfortably; and I dare say, you and every one that reads the Scriptures with Desire of a Blessing, will experience the like, *viz.* When you are reading, and come to any Place that touches, and that your Mind is affected with, you shall find even whether you will or no, your Heart will every now and then lift it self up thus, *Lord! make good this* Word *to me! Lord! draw my Heart thus to thee! Lord! help me thus to seek thee*, and the like; and be not afraid to call that praying; for *mental Petition* is Prayer as well as Words; and is, perhaps the best mov'd Prayer, and the best express'd in the World.

FOREIGN AFFAIRS.

Extract of a Letter from the Agent *of* New-Jersey, *Dated from* London, *the 6th of the 3d Month (called* May,*)* 1729.

---- *I lately wrote to thee,* &c. *something in relation to a Bill depending in the House of Commons, that I apprehended would be very injurious to our Plantations, and I had a Petition preferr'd against it; upon which I was admitted to be heard by Council before a Committee of the whole House, which accordingly was done last* 5*th* Day, *and thereupon the Clause relating to* Pine-Trees *was amended pretty much to our Satisfaction; and as to the Clause of prohibiting us to make Bar and Rod-Iron, it is wholly dropt.*

---- As for the Bounty on Naval Stores, I send thee enclosed a Copy herewith of Part of the Clauses relating thereto, as it is likely to pass into a Law; the Bill is now engrossed, and I suppose, will be at the House of Lords, and have the Royal Assent in 4 or 5 Days Time.

The Bounty is as follows, *viz.*

For all Masts, Yards, and Bowsprits *per* Ton, allowing 40 Feet to each Ton Girt-Measure, according to the customary Way of measuring round Bodies, One Pound Sterling

For clean good merchantable Tar, clear of Drois or Water, fit for making Cordage, *per* Ton, containing 8 Barrels, to gage 31 and half Gallons, to be well hoop'd, and fill'd up, Two Pounds, Four Shillings.

For clean, good, well conditioned Pitch, not mix'd with Dirt and Drois, *per* Ton, containing 20 Gross Hundred (Neat Pitch) to be brought in 8 Barrels of equal Size, One Pound.

For clean, good Merchantable Turpentine clear of Drois and Water, *per* Ton, each Ton containing 20 Gross Hundred (Neat Turpentine) to be brought in 8 Barrels of equal Size, One Pound, Ten Shillings.

Which Premiums are to be paid by the Commissioners of the Navy or their Head-Officers.

Petersburgh, April 14. The Fleet which is fitting out in our Ports, will consist of 47 Men of War of the Line, of 24 Frigates, and about 200 Gallies, on board of which Vessels 14000 Seamen are to embark. This formidable Fleet is to be victualled with 3500 Oxen, 6000 Hogs, 73,000 Tuns of Beer, 900 Barrels of Brandy and Bisket in Proportion: The Sailors who are Foreigners are to have six Rubles a Month, and the Russians four. If the Turks should attack this Empire, it is likely that Bagdad will be the Place of Rendezvous of their Troops; for we hear that 60,000 Men are already arrived there: This City, which is situate on the Tigris about a Days Journey from Babylon and consequently a Frontier of Persia, lies very properly for their Designs. The Tartars who are obliged to assist the Turks in the Wars, ever since the Sultan Solim made them Tributary to the Port, in 1584, will be employed to make a Diversion in Russia, while the Turks and the Persians attack the Muscovites on the side of the Caspian Sea.

Paris, April 29. The Envoys of Tripoli are arrived here, in Number Three, attended only by one Domestick each. They declared to the Interpreter, that the most fearful Slave never approach'd the Divan with more Submission than they should do his Most Christian Majesty; and that they would study to make themselves worthy of appearing at the Feet of the King, when he should command them. On the other Hand, the Interpreter has Orders to pass

paſs two Hours with them every Day, to inform them of the vaſt Conqueſts of Lewis XIV. as alſo of the mighty Power of Lewis XV. and of the Indulgence he is graciouſly pleaſed to give to thoſe Nations, whether diſtant or near, that repoſe their Confidence in him: That he is the great Arbitrator of the Differences of Europe, and the equal Diſpenſer of Juſtice to all the World.

Amſterdam, May 3. The Price of Stocks upon our Exchange is riſen 3 or 4 per Cent. which is attributed to the Advices from abroad, that Affairs have taken a favourable Turn for Peace.

Paris, May 7. They write from Bezanzon, that the Tower, in which the Holy Handerchief was kept, was fallen down, but no body hurt.

Boſton. We have the following melancholy Account from Kingſton in Jamaica, That on the 5th of June laſt a large Sloop commanded by one Charles Cooper, bound for ſome Part of the Main, having got to Sail, and ſaluting the Town on their Departure, the third Gun ſet Fire to all the Powder that was on Board, and blew ſome of the Men who were aft over the Gaft; the Sloop hoiſted up, and then immediately ſunk with about 60 white Men, and near 300 Negroes; only the Captain and 19 more of the white Men were ſaved, and about 40 or 50 of the Negroes, tho' ſome with their Limbs ſadly broken and maimed. The Captain ſays, one of his Men told him ſince, that there were a great many more in the Veſſel hid in the Hole, than he had in his Liſt; ſo that we are not informed exactly how many were blown to pieces and drowned.

Albany. Jul. 10. Laſt Night about 12-a clock a Fire broke out in a Baker's Houſe in this City, and with great Violence burnt down 7 Houſes, and deſtroyed great Part of the Goods and Merchandize therein. And there is about 17 or 18 more that are in great part deſtroyed by being pulled down and broke, in Order to ſtop the Fury of the Fire.

New-York, Auguſt 4. The Ship Albany, William Bryant Maſter, arrived here yeſterday in 6 weeks from Gibraltar, brings an Account that the Spaniards lie intrencht near the walls of Gibraltar; that we have fifteen hundred Men conſtantly at work in fortifying that Place. That Admiral Wager lay in the Downs with 18 Sail of Ships; but juſt as Capt. Bryant was coming away, a Packet-Boat from England arrived at Gibraltar, giving an Account that the Admiral was countermanded, and that the Peace was concluded, and that the Congreſs at Soiſſons broke up. That the King was actually gone for Hanover: That Capt. Norris was at Lisbon, where a large Portuguze Fly-boat got foul of him, and Capt. Norris cauſed her Maſts to be cut down; whereupon the Portugueze have ſtopt Capt. *Norris* till he makes Satisfaction for the Damage done to the ſaid Fly-Boat.

London, April 17. This Day was continued a Courſe of Anatomical Lectures, begun on Monday by a Surgeon near Bloomsbury, on the Carcaſs of a whimſical Lawyer lately deceaſed, who bequeath'd his Body by Will to the ſaid Surgeon to diſſect and make a Skeleton of it, in order for his Friends to ſee it ſo often as they ſhould call, with Directions to treat them with a Glaſs of Wine as the Premium for the Gift.

Entred inwards.

Sloop *Weſtmorland, Jaſon Vaughan* from *Milford.*
Snow *John & David, Robert Jameſon* from *Glaſgow* and *Belfaſt.*
Ship *Freedom, James Nicholſon,* from *Whitehaven* and *Dublin.*
Sloop *Catharine* and *Anne,* Duncan Murrey from *Virginia.*

Entred Outwards.

Sloop *Andrew, John Briggs,* from *Barbadoes.*

Cleared.

Ship *Brunſwick, Edw. M Corniſh* to *Glaſgow.*

RUN away from Edward Kemble, of the Townſhip of Springfield, in the County of Burlington, a Servant Man, named John Cope, of a ſmall Stature, brown Complexion, and ſhort black Hair; had on when he went away, a good Beaver Hat, darkiſh grey Jacket, ſtriped Ticken Breeches, Stockens of a grey Colour, and good Shoes. Whoever ſecures the ſaid Runaway, ſo that his Maſter may have him again, ſhall have Thirty Shillings Reward, and reaſonable Charges paid by me,

Edward Kemble.

VERY good Live-Geeſe Feathers to be ſold by *Evan Powel,* in Cheſnut-ſtreet, next Door but one to *Andrew Hamilton,* Eſq;

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